US009445653B2

(12) **United States Patent**
Liu et al.

(10) **Patent No.: US 9,445,653 B2**
(45) **Date of Patent: Sep. 20, 2016**

(54) **BLUETOOTH AUDIO**

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(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 25 days.

(21) Appl. No.: **14/479,851**

(22) Filed: **Sep. 8, 2014**

(65) **Prior Publication Data**

US 2016/0066664 A1 Mar. 10, 2016

(51) **Int. Cl.**

H04B 3/00	(2006.01)
A45B 3/00	(2006.01)
H04R 1/02	(2006.01)
H04R 9/06	(2006.01)

(52) **U.S. Cl.**

CPC ***A45B 3/00*** (2013.01); ***H04R 1/025*** (2013.01); ***H04R 1/028*** (2013.01); *A45B 2200/1009* (2013.01); *H04R 2420/07* (2013.01)

(58) **Field of Classification Search**

CPC .. H04R 1/025; H04R 1/028; H04R 2420/07; A45B 3/00; A45B 2200/1009

USPC 381/77, 301, 322, 324, 334; 455/66.1, 455/41.2, 41.3, 572

See application file for complete search history.

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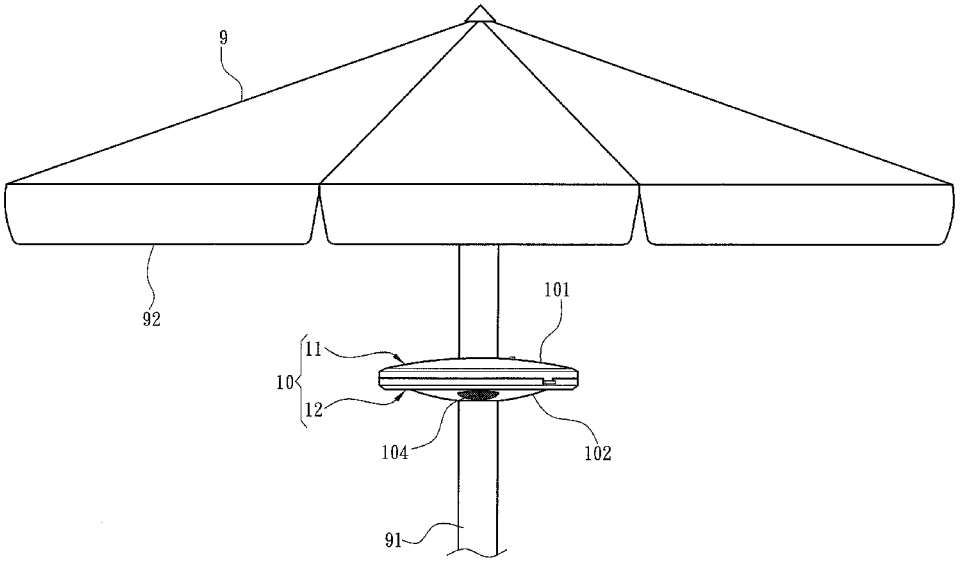
(57) **ABSTRACT**

A Bluetooth audio that can be selectively installed on an umbrella shaft of an umbrella includes an audio body, a coupling shell and a clamp device. The audio body includes an installation recess which has an installation space for installing the umbrella shaft. The installation recess has a closed end corresponding to the substantial center of the audio body and an open end located on an edge of the audio body and corresponding to the closed end. The coupling shell can be selectively placed in the installation space through the open end and installed in the installation recess to close the open end and confine the umbrella shaft at the closed end. The clamp device is located in the audio body corresponding to the closed end and operable by a user's hand to clamp the umbrella shaft.

13 Claims, 7 Drawing Sheets



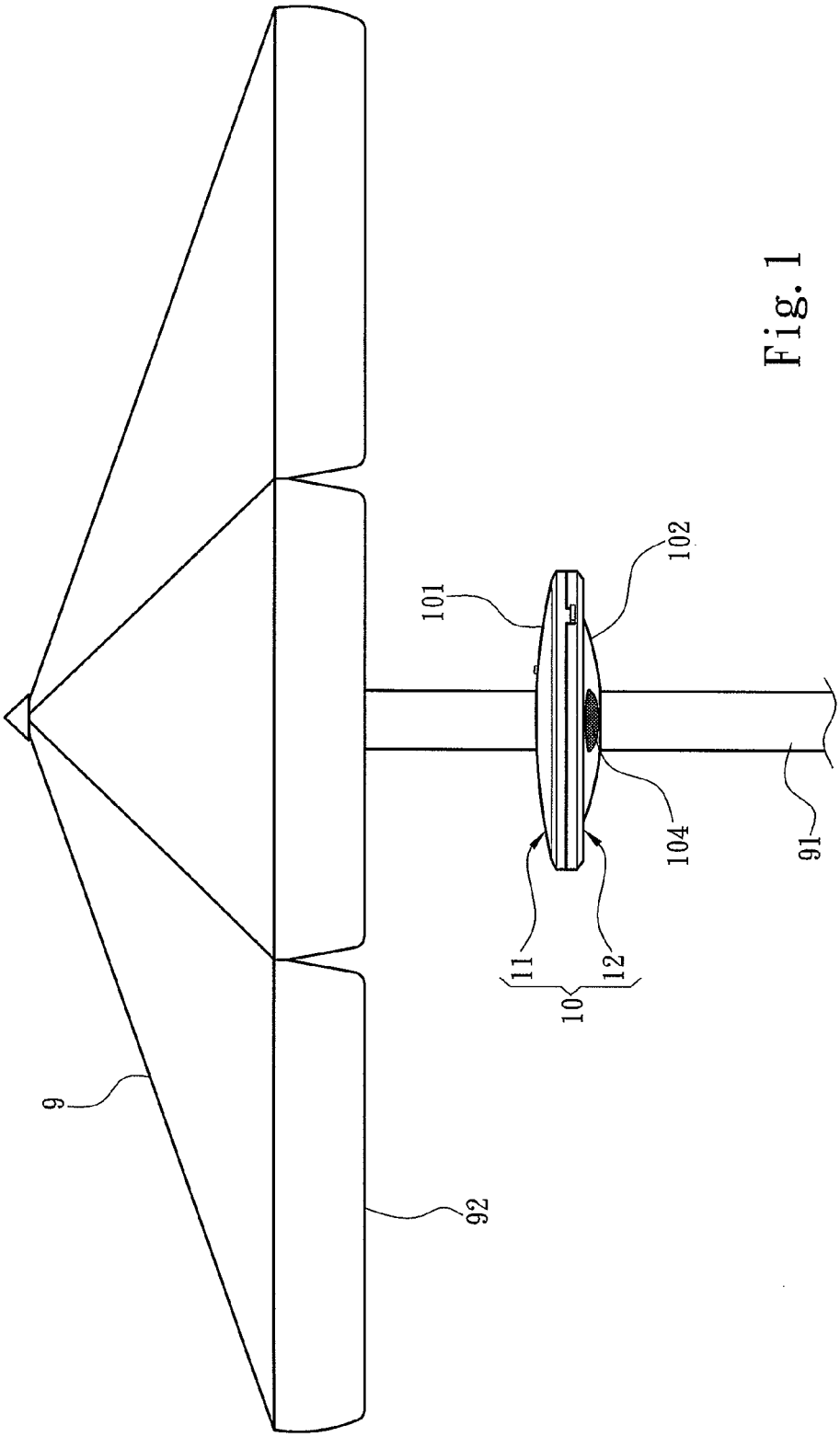


Fig. 1

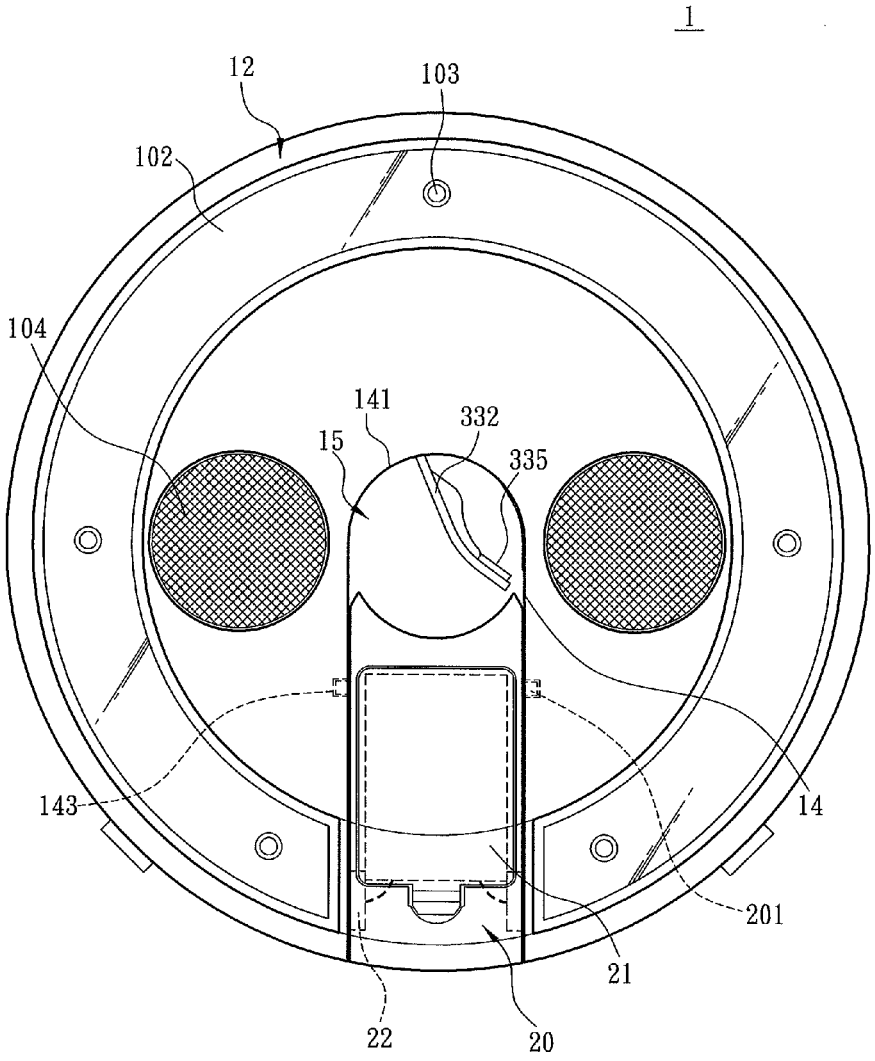
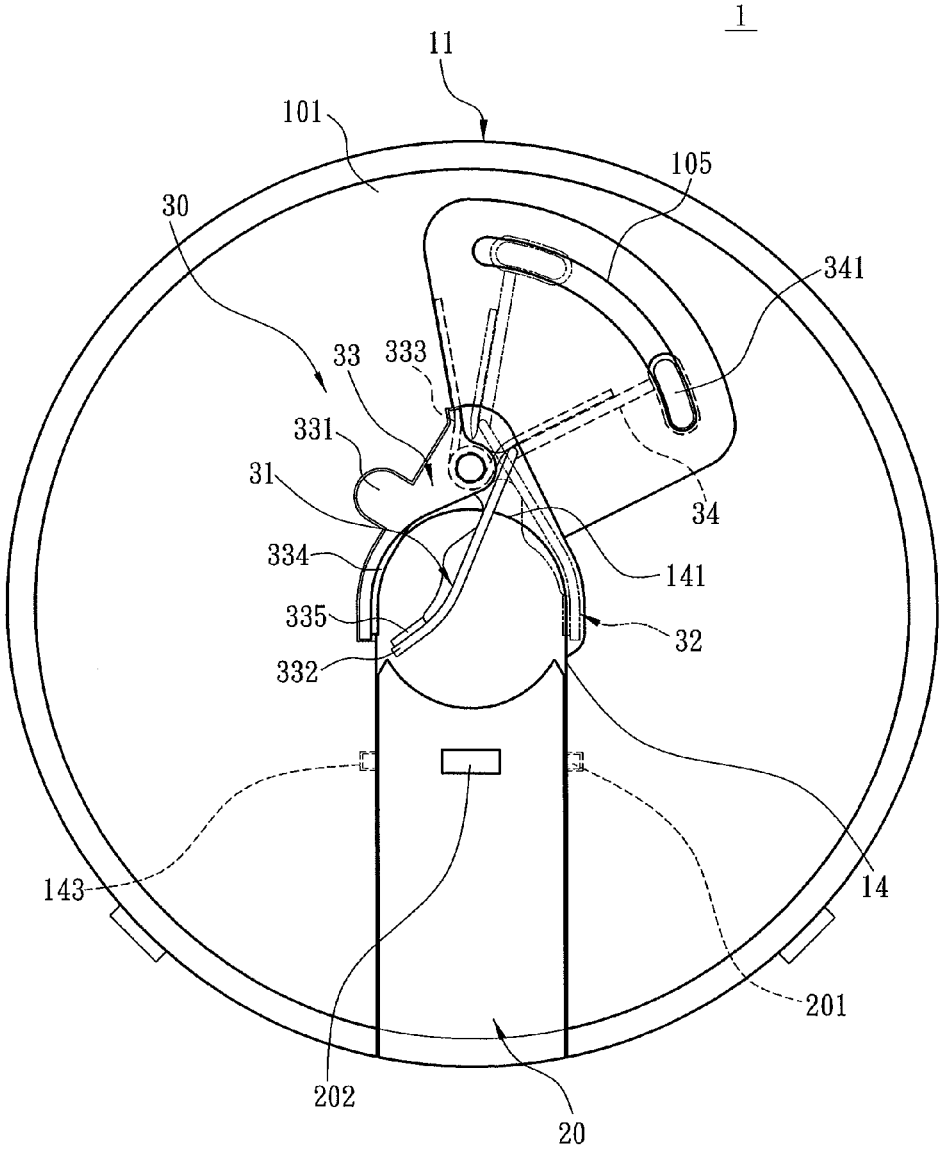


Fig. 2


1
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101
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Fig. 3

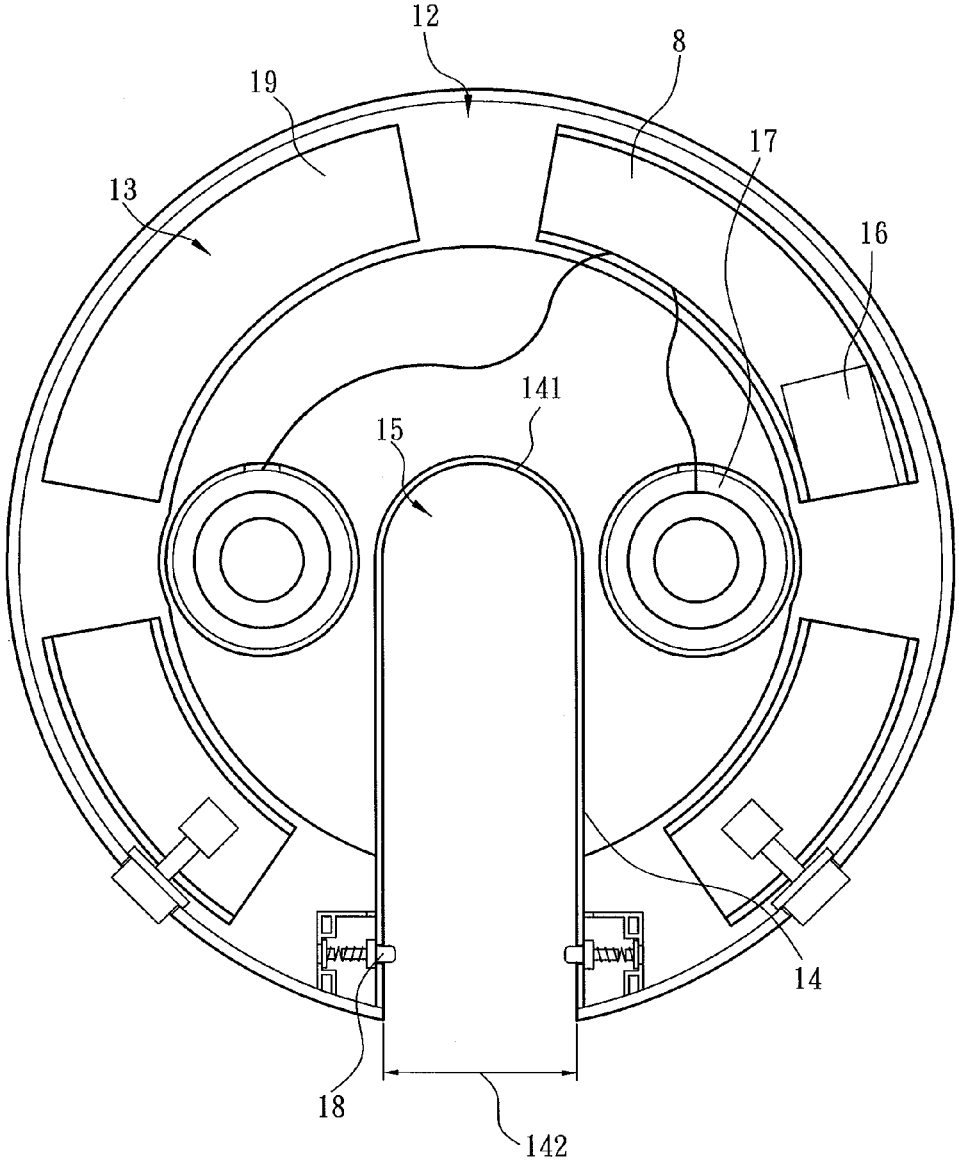

Fig. 4

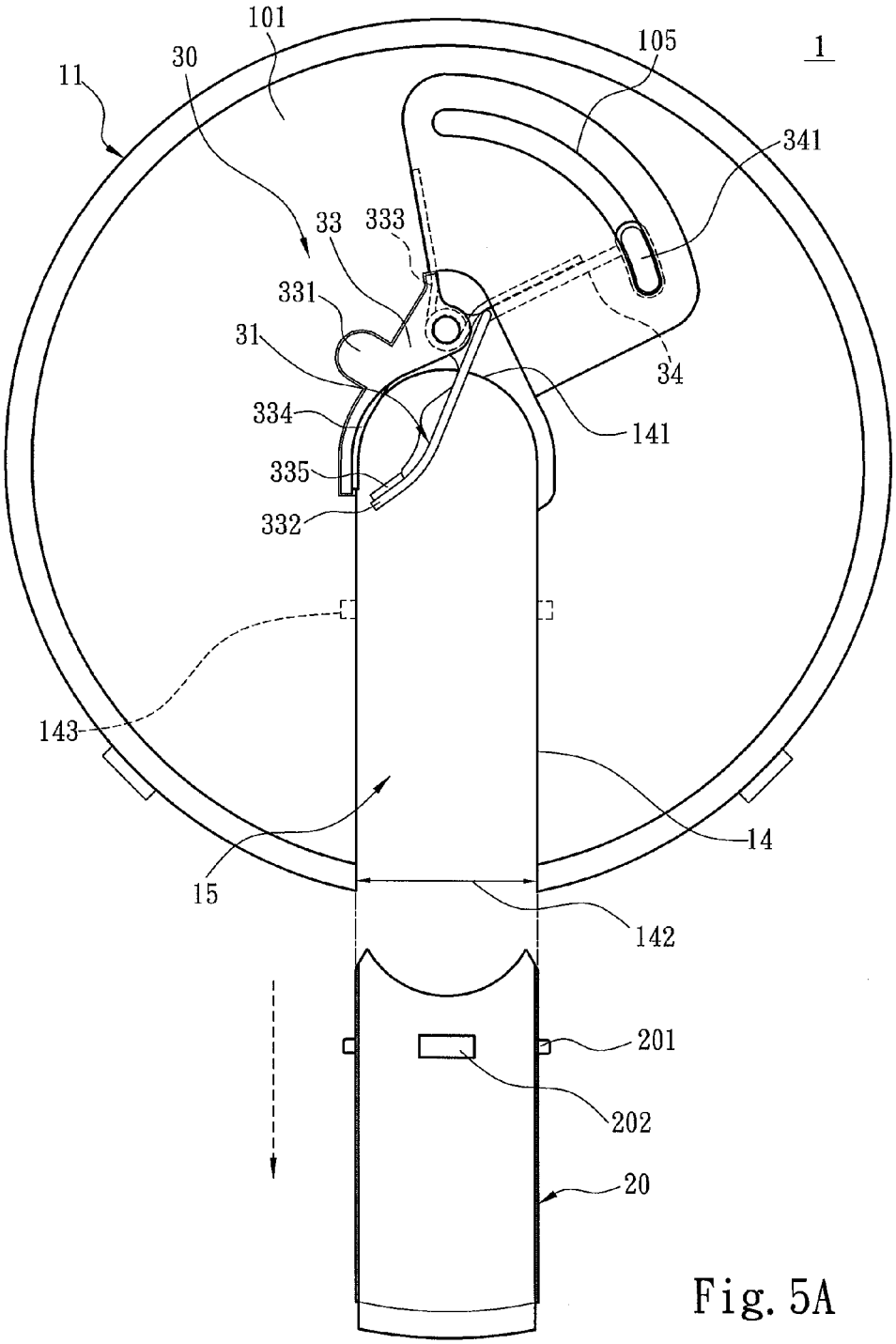
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Fig. 5A

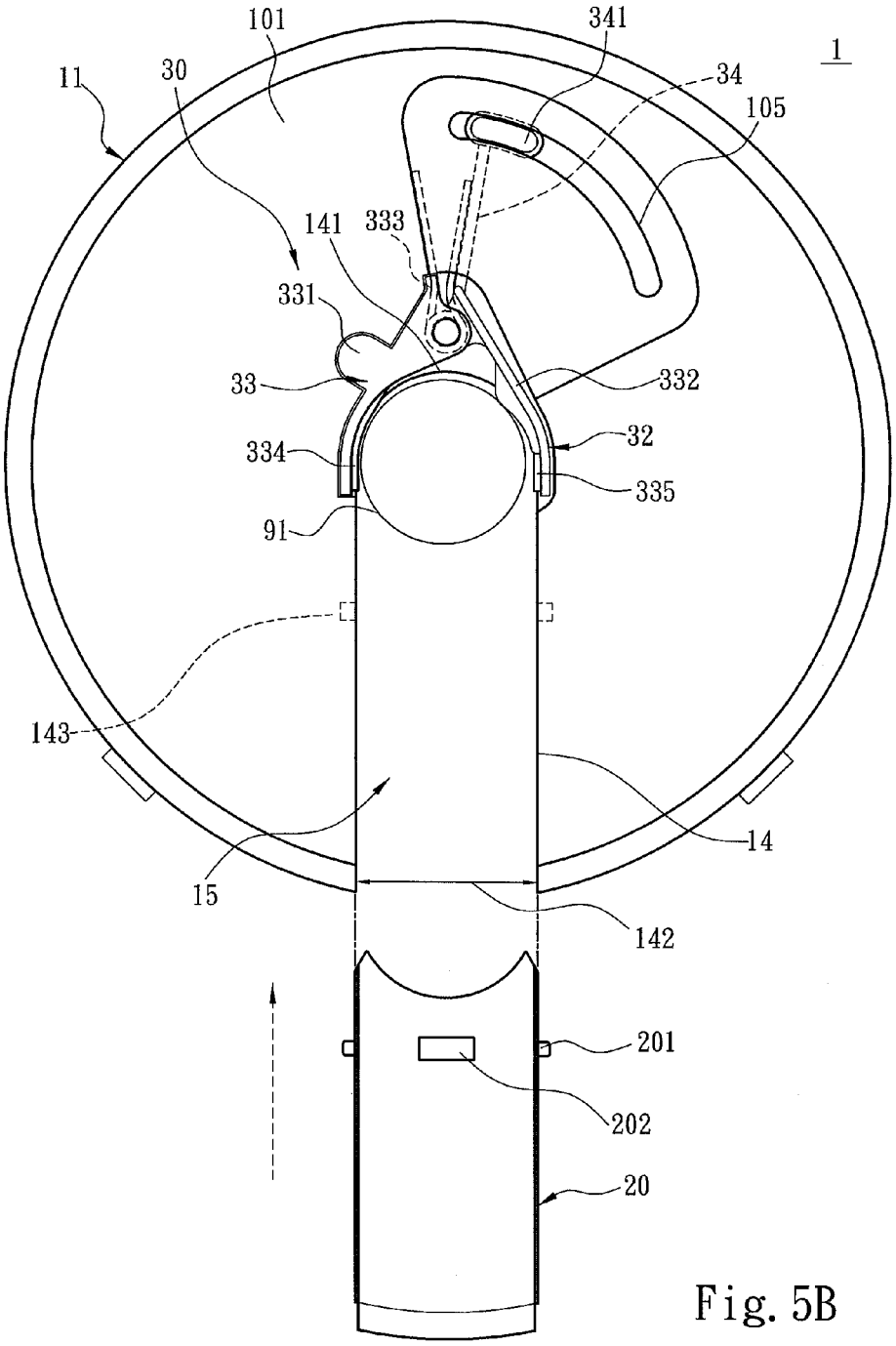
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Fig. 5B

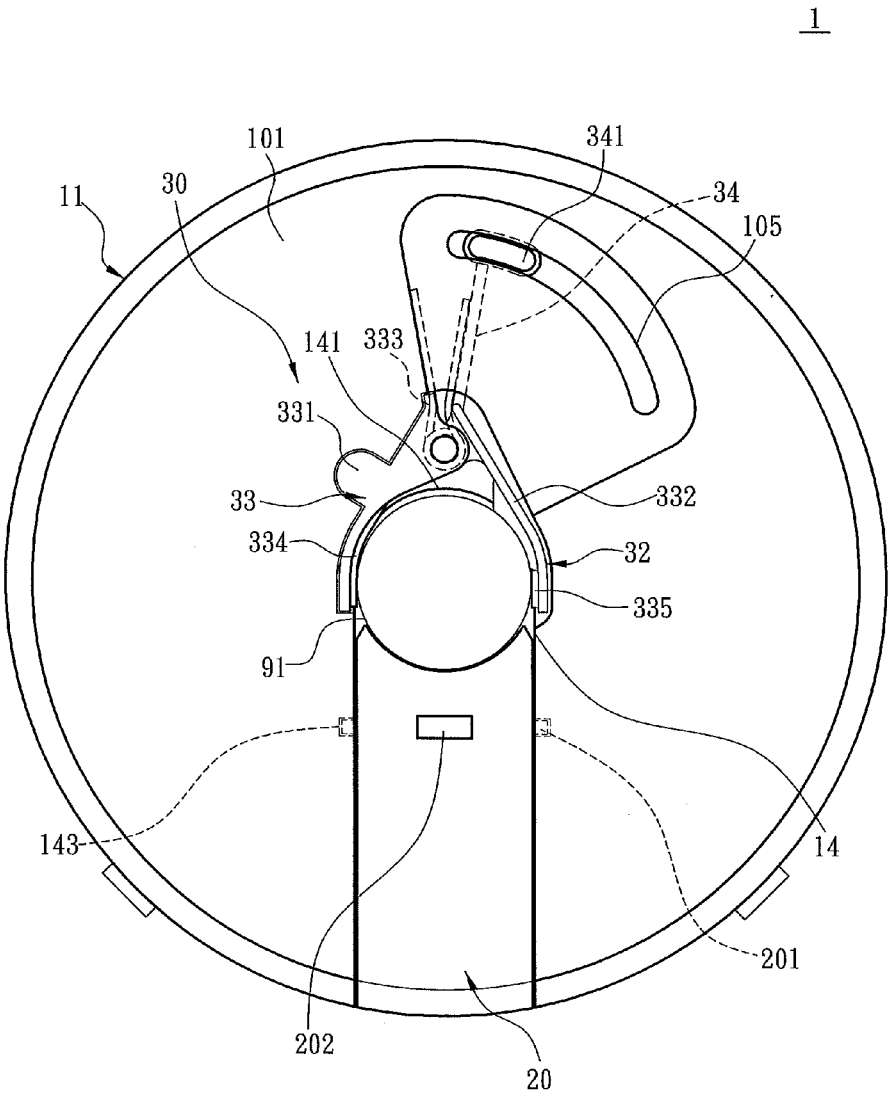
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Fig. 5C

BLUETOOTH AUDIO

FIELD OF THE INVENTION

The present invention relates to a Bluetooth audio and particularly to a Bluetooth audio that is selectively installable on an umbrella shaft of an umbrella.

BACKGROUND OF THE INVENTION

Outdoor activities are very popular these days. During holidays many people have flocked to parks or forests to be close to nature for a change. Various types of outdoor furniture also have been developed and marketed to suit this trend, such as parasols, folding tables and chairs, portable cooking facilities and the like. Take parasol as an example. It mainly provides a shade area for people to rest and fend off sunshine. The conventional parasols mostly provide merely sunshade function. Some vendors now have tried to attach furniture to the parasol to improve its usability.

For instance, U.S. Pat. Nos. 7,134,762 and 7,497,583 disclose a light providing apparatus attachable to umbrella. The light providing apparatus includes a body, a clamping device, a light source and a power supply unit. The body has an inner wall and an opening to hold the umbrella. The clamping device is located on the inner wall facing the opening with a front end movable against the inner wall through a spring. Thus the light providing apparatus can be attached to the umbrella. Although the aforesaid technique provides a clamping structure installable on the umbrella, the holding strength of the clamping device on the umbrella depends on the elastic force of the spring. In the event that the elastic force weakens the clamping device cannot securely clamp the umbrella, then the light providing apparatus could be shaking against the umbrella. Moreover, the clamping device and the umbrella of the aforesaid technique are in contact with each other for merely a small area, hence it still leaves a lot to be desired in terms of the force for anchoring on the umbrella.

SUMMARY OF THE INVENTION

The primary object of the present invention is to solve the problem of the conventional structure of unable to provide steady holding on the umbrella.

To achieve the foregoing object the present invention provides a Bluetooth audio that can be selectively installed on an umbrella shaft of an umbrella. The Bluetooth audio includes an audio body, a coupling shell and a clamp device. The audio body includes an installation recess which has an installation space for installing the umbrella shaft, a housing space formed inside, a Bluetooth module located in the housing space to form information link with an external electronic device through a Bluetooth file transmission protocol to receive an audio signal, a loudspeaker module to form information link with the Bluetooth module to receive the audio signal and output music, and at least one first power terminal located on one side of the installation recess and faced the installation space to form electrical connection with the Bluetooth module. The installation recess has a closed end corresponding to the substantial center of the audio body and an open end located at the edge of the audio body corresponding to the closed end. The coupling shell can be selectively placed in the installation space through the open end and installed in the installation recess to close the open end to confine and position the umbrella shaft at the closed end. The coupling shell includes a power supply module disposed therein to store working power and a second power terminal electrically connected to the power supply module and formed electrical contact with the first power terminal when the coupling shell is installed in the installation recess to supply the working power stored in the power supply module to the Bluetooth module and the loudspeaker module. The clamp device is located on the audio body corresponding to the closed end and includes a clamp member located in the installation space and controllable to slide to a first position or a second position to release or clamp the umbrella shaft, and an operation member connected to the clamp member and operable by a user's hand to move the clamp member.

In one aspect the audio body has a first surface faced an umbrella panel of the umbrella and a second surface remote from the umbrella panel.

In another aspect the clamp device is located on the first surface of the audio body.

In yet another aspect the audio body includes a plurality of lighting elements disposed on the second surface and received the working power from the first power terminal to emit light.

In yet another aspect the lighting elements are located annularly on the edge of the audio body.

In yet another aspect the Bluetooth module and the lighting elements are located on a same circuit board.

In yet another aspect the audio body has an installation cavity on the second surface to hold the clamp device.

In yet another aspect the operation member includes a poking portion exposed outside of the first surface and operable by a user and the audio body has a confining track to confine a movement of the poking portion when operated by the user.

In yet another aspect the clamp member includes a first segment fixedly located in the installation recess, a second segment hinged on the first segment and capable of sliding between the first position and the second position, and an elastic element abutting respectively the first segment and the second segment to provide a return force to position the second segment at the first position in normal conditions.

In yet another aspect the first segment has a first elastic pad at one side facing the second segment, and the second segment has a second elastic pad at one side thereof facing the first segment.

In yet another aspect the audio body has a loudspeaker opening formed on the second surface corresponding to the loudspeaker module to output music outside the audio body.

In yet another aspect the audio body includes a first half shell and a second half shell that are coupled with each other.

In yet another aspect the audio body has at least one confining cavity on one side of the installation recess facing the installation space, and the coupling shell has at least one latch member to latch in the confining cavity to form a confining relationship between therewith when the coupling shell is installed in the installation recess.

In yet another aspect the coupling shell has an operation button connected to the latch member that is operable by the user to release the confining relationship between the latch member and the confining cavity.

Through the structure set forth above, compared with the conventional techniques, the invention provides features as follows:

With the clamp member operable by user's hand, and the clamp member formed surface contact with the umbrella shaft after installation, the audio body can be securely installed on the umbrella shaft.

The foregoing, as well as additional objects, features and advantages of the invention will be more readily apparent from the following detailed description, which proceeds with reference to the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is a schematic view of an embodiment of the invention in an implementation condition.

FIG. **2** is fragmentary schematic view-**1** of the structure of an embodiment of the invention.

FIG. **3** is fragmentary schematic view-**2** of the structure of an embodiment of the invention.

FIG. **4** is fragmentary schematic view-**3** of the structure of an embodiment of the invention.

FIG. **5**A is schematic view-**1** of the assembly process of an embodiment of the invention.

FIG. **5**B is schematic view-**2** of the assembly process of an embodiment of the invention.

FIG. **5**C is schematic view-**3** of the assembly process of an embodiment of the invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

Please referring to FIGS. **1** through **4**, the present invention aims to provide a Bluetooth audio **1** which can be selectively installed on an umbrella shaft **91** of an umbrella **9**. The Bluetooth audio **1** includes an audio body **10**, a coupling shell **20** and a clamp device **30**. The audio body **10** can be formed by coupling a first half shell **11** and a second half shell **12** with each other, and includes a housing space **13**, an installation recess **14** to form an installation space **15** for installing the umbrella shaft **91**, a Bluetooth module **16** located in the housing space **13**, a loudspeaker module **17** connected to the Bluetooth module **16**, and at least one first power terminal **18** located on one side of the installation recess **14** and faced the installation space **15** to form electrical connection with the Bluetooth module **16**. More specifically, the audio body **10** has a first surface **101** faced an umbrella panel **92** of the umbrella **9**, and a second surface **102** remote from the umbrella panel **92**. The audio body **10** also has a plurality of lighting elements **103** scattered on the second surface **102** to get working power from the first power terminal **18** to emit light. In one embodiment the lighting elements **103** are located annularly on the edge of the audio body **10**. The lighting elements **103** can be located on a same circuit board **8** with the Bluetooth module **16**. The circuit board **8** can be adjusted according to the profile of the audio body **10**. For instance, in the event that the audio body **10** is circular, the circuit board **8** can be formed in an arched shape to mate the audio body **10**. Moreover, the installation recess **14** has a closed end **141** corresponding to the substantial center of the audio body **10** and an open end **142** located on the edge of the audio body **10** corresponding to the closed end **141**. The Bluetooth module **16** forms an information link with an external electronic device (not shown in the drawings) through a Bluetooth file transmission protocol to receive an audio signal. The external electronic device can be a notebook computer, a handheld mobile phone or the like. The loudspeaker module **17** forms another information link with the Bluetooth module **16** via an electric line to receive the audio signal to intensify sound and output music. In addition, the audio body **10** has a loudspeaker opening **104** on the second surface **102** corresponding to the loudspeaker module **17** to output the music outside the audio body **10**.

In practice, the coupling shell **20** can be designed according to the profile of the installation recess **14** so that it can be selectively placed in the installation space **15** via the open end **142** and installed in the installation recess **14** to close the open end **142** and confine the umbrella shaft **91** at the closed end **141**. The coupling shell **20** has a power supply module **21** located inside to store working power, and a second power terminal **22** electrically connected to the power supply module **21** and formed electric contact with the first power terminal **18** when the coupling shell **20** is installed in the installation recess **14** to supply the stored working power from the power supply module **21** to the Bluetooth module **16** and the loudspeaker module **17**. Furthermore, the power supply module **21** can be a battery to provide the working power. In addition, the coupling shell **20** can also be selectively coupled with the installation recess **14**. In order to confine the coupling shell **20** in the installation recess **14** at a desired position, in one embodiment the audio body **10** has at least one confining cavity **143**, and the coupling shell **20** has at least one latch member **201**. The confining cavity **143** is located on one side of the installation recess **14** facing the installation space **15**. The latch member **201** corresponds to the confining cavity **143** to form a confining relationship therewith when the coupling shell **20** is installed in the installation space **15**. Namely, when the coupling shell **20** is sliding in the installation space **15** the latch member **201** sinks into the confining cavity **143** so that the coupling shell **20** cannot continuously slide and is confined at a desired position. In addition, the coupling shell **20** further has an operation button **202** connected to the latch member **201** to be operated by a user to release the confining relationship between the latch member **201** and the confining cavity **143**. More specifically, the latch member **201** and the operation button **201** can be linked in movement through a mechanical structure. In one embodiment the latch member **201** can be driven by the operation button **202** to move reciprocally against the surface of the coupling shell **20**. Thus, when the operation button **202** is operated by the user it drives the latch member **201** away from the confining cavity **143** and escaping therefrom so that coupling shell **20** is movable again in the installation space **15**.

Also referring to FIGS. **1** through **4** again, the clamp device **30** is located on the audio body **10** corresponding to the closed end **141** of the installation recess **14**. More specifically, the clamp device **30** is located on the first surface **101** of the audio body **10**, and includes a clamp member **33** located in the installation space **15** and controllable to slide between a first position **31** and a second position **32**, and an operation member **34** connected to the clamp member **33** and operable by user's hand to drive the clamp member **33**. Furthermore, the first position **31** means the location of the clamp member **33** in the installation space **15**, and the second position **32** means the clamp member **33** is moved and skewed to one side of the installation recess **14** to release the umbrella shaft **91**. In addition, the clamp member **33** has a first segment **331** fixedly located in the installation recess **14**, a second segment **332** hinged on the first segment **331** and capable of sliding between the first position **31** and the second position **32**, and an elastic element **333** to abut the first segment **331** and the second segment **332** and provide a return force to position the second segment **332** at the first position in normal conditions. In another embodiment the first segment **331** has a first elastic pad **334** at one side facing the second segment **332**, and the second segment **332** has a second elastic pad **335** at one side facing the first segment **331**. When the first elastic pad **334** and the second elastic pad **335** are in contact with

the umbrella shaft **91** a friction force is generated to securely hold the Bluetooth audio **1** on the umbrella shaft **91**. The first elastic pad **334** and the second elastic pad **335** can be rubber products. In yet another embodiment the audio body **10** has an installation cavity **19** on the second surface **102** to hold the clamp device **30**. The installation cavity **19** makes the clamp device **30** at an elevation same as the second surface **102** upon being placed therein so that the clamp device **30** does not notably expose outside the Bluetooth audio **1** to enhance appeal of the Bluetooth audio **1**. In addition, in yet another embodiment the operation member **34** has a poking portion **341** exposed outside the first surface **101** and operable by the user, and the audio body **10** has a confining track **105** to confine the movement locus of the poking portion **341** when it is operated by the user.

Please referring to FIGS. **1** and **5**A through **5**C, the Bluetooth audio **1** can be installed on the umbrella shaft **91** of different diameters. During assembly, first, separate the coupling shell **20** and the audio body **10** to release the closed installation space **15**; next, place the umbrella shaft **91** in the installation space **15** through the open end **142**, meanwhile user maneuvers the operation member **34** to move the clamp member **33** temporarily from the first position **31** to the second position **32**; then moves the operation member **34** again after the umbrella shaft **91** is held at the closed end **141** of the installation space **15** to move the clamp member **33** from the second position **32** to the first position **31**; during moving of the clamp member **33** to the first position **31**, it clamps the umbrella shaft **91** so that the second segment **332** forms surface contact with the umbrella shaft **91** to securely hold the audio body **10** on the umbrella shaft **91**. Then the coupling shell **20** can be placed into the installation space **15** through the open end **142** with the front end thereof abutting the umbrella shaft **91**, thereby the umbrella shaft **91** is firmly confined by the closed end **142** of the installation space **15**. As a result, the Bluetooth audio **1** can be installed on the umbrella shaft **91**.

As a conclusion, the Bluetooth audio of the invention can be selectively installed on an umbrella shaft, and includes an audio body, a coupling shell and a clamp device. The audio body has an installation recess to form an installation space and allow the umbrella shaft to be installed inside. The installation recess has a closed end corresponding to the substantial center of the audio body and an open end corresponding to the closed end and located at the edge of the audio body. The coupling shell can selectively enter installation space through the open end and be installed in the installation recess to close the open end and confine the umbrella shaft at the closed end. The clamp device is located in the audio body corresponding to the closed end and is operable by a user to clamp the umbrella shaft, thereby the Bluetooth audio can be securely held on the umbrella shaft.

What is claimed is:

1. A Bluetooth audio device selectively installable on an umbrella shaft of an umbrella, comprising:

an audio body including an installation recess which includes an installation space to allow the umbrella shaft installed therein, a housing space formed therein, a Bluetooth module located in the housing space and forming information link with an external electronic device through a Bluetooth file transmission protocol to receive an audio signal, a loudspeaker module forming information link with the Bluetooth module to receive the audio signal and output music, and at least one first power terminal located at one side of the installation recess and facing the installation space to form electrical connection with the Bluetooth module; wherein the installation recess includes a closed end corresponding to a substantial center of the audio body and an open end located on an edge of the audio body and corresponding to the closed end;

a coupling shell which is selectively placed in the installation space through the open end and installed in the installation recess to close the open end and confine the umbrella shaft at the closed end, and includes a power supply module disposed therein to store working power and a second power terminal which is electrically connected to the power supply module and forms electric contact with the first power terminal when the coupling shell is installed in the installation recess to supply the working power stored in the power supply module to the Bluetooth module and the loudspeaker module via the first power terminal; and

a clamp device which is located in the audio body and corresponding to the closed end of the installation recess, and includes a clamp member located in the installation space and controllable to slide to a first position or a second position to release or clamp the umbrella shaft and an operation member connected to the clamp member and operable by a user's hand to move the clamp member, wherein the clamp member includes a first segment fixed in the audio body and located in the installation recess, a second segment which is disposed in the audio body hinged on the first segment and capable of sliding between the first position and the second position, and an elastic element abutting the first segment and the second segment to provide a return force to position the second segment at the first position in regular conditions.

2. The Bluetooth audio device of claim **1**, wherein the audio body includes a first surface facing an umbrella panel of the umbrella and a second surface remote from the umbrella panel.

3. The Bluetooth audio device of claim **2**, wherein the clamp device is located on the first surface of the audio body.

4. The Bluetooth audio device of claim **3**, wherein the audio body includes a plurality of lighting elements disposed on the second surface and receiving the working power from the first power terminal to emit light.

5. The Bluetooth audio device of claim **4**, wherein the lighting elements are located annularly on the edge of the audio body.

6. The Bluetooth audio device of claim **4**, wherein the Bluetooth module and the lighting elements are located on a same circuit board.

7. The Bluetooth audio device of claim **2**, wherein the audio body includes an installation cavity on the second surface to hold the clamp device.

8. The Bluetooth audio device of claim **2**, wherein the operation member includes a poking portion exposed outside the first surface and operable by a user, and the audio body includes a confining track to confine a movement of the poking portion operated by the user.

9. The Bluetooth audio device of claim **1**, wherein the first segment includes a first elastic pad at one side thereof facing the second segment, and the second segment includes a second elastic pad at one side thereof facing the first segment.

10. The Bluetooth audio device of claim **2**, wherein the audio body includes a loudspeaker opening on the second surface corresponding to the loudspeaker module to output music outside the audio body.

11. The Bluetooth audio device of claim 1, wherein the audio body includes a first half shell and a second half shell that are coupled with each other.

12. The Bluetooth audio device of claim 1, wherein the audio body includes at least one confining cavity on one side of the installation recess facing the installation space, the coupling shell including at least one latch member to latch in the confining cavity to form a confining relationship therewith when the coupling shell is installed in the installation recess.

13. The Bluetooth audio device of claim 12, wherein the coupling shell includes an operation button connected to the latch member and operable by a user to release the confining relationship between the latch member and the confining cavity.

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